

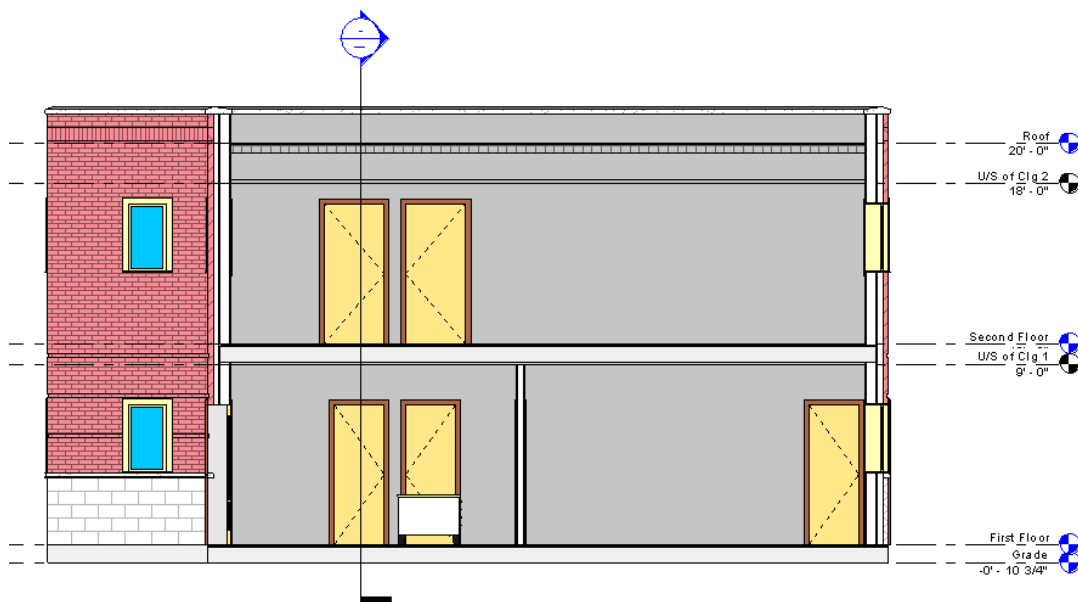
AGENDA:

1. Section Views – Building Sections, Wall Sections, and Detail Sections
2. Callout Views

1. Section Views

Section Views allow you to define a cutting plane through your building model. Sections may be created in Plan or Elevation Views as well as in other Section Views and Detail views.

Sections allow you to take a slice through your model to create full Building Sections, Wall Sections, and Detail Sections. Each of the three main types of Sections has its own graphic display settings and they may be grouped in separate categories in the Project Browser.



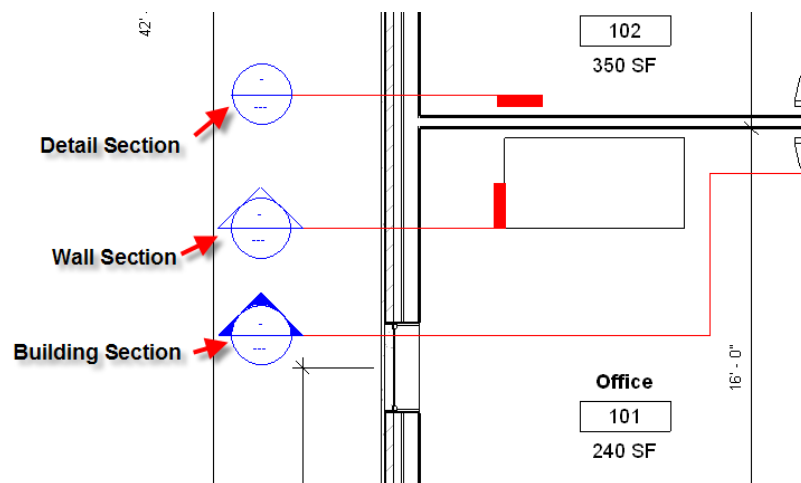
Sections are created by choosing the Section tool on the View Tab, choosing the Section Type in the Type Selector, and then picking two points to define the extents of the section box as it cuts through the building.

Building Sections will be listed in the Sections category in the Project Browser. The Section line for a Building Section extends across the entire building.

Wall Sections may be defined in a plan view, with their own Section Line which will extend only a short distance on either side of one exterior wall. Wall Sections are shown with a different type of Section head than a full building section and to vary the appearance, should be set to the Wall Section Type. Wall sections defined with this method will be listed in their own Wall Sections Category of the Project Browser.

Detail Sections may be defined in Plan, Elevation, or Section Views. Use the Section tool with the Type set to Detail and pick two points to define the extents of the Section. Detail Sections are grouped together in the Detail Views category in the Project Browser.

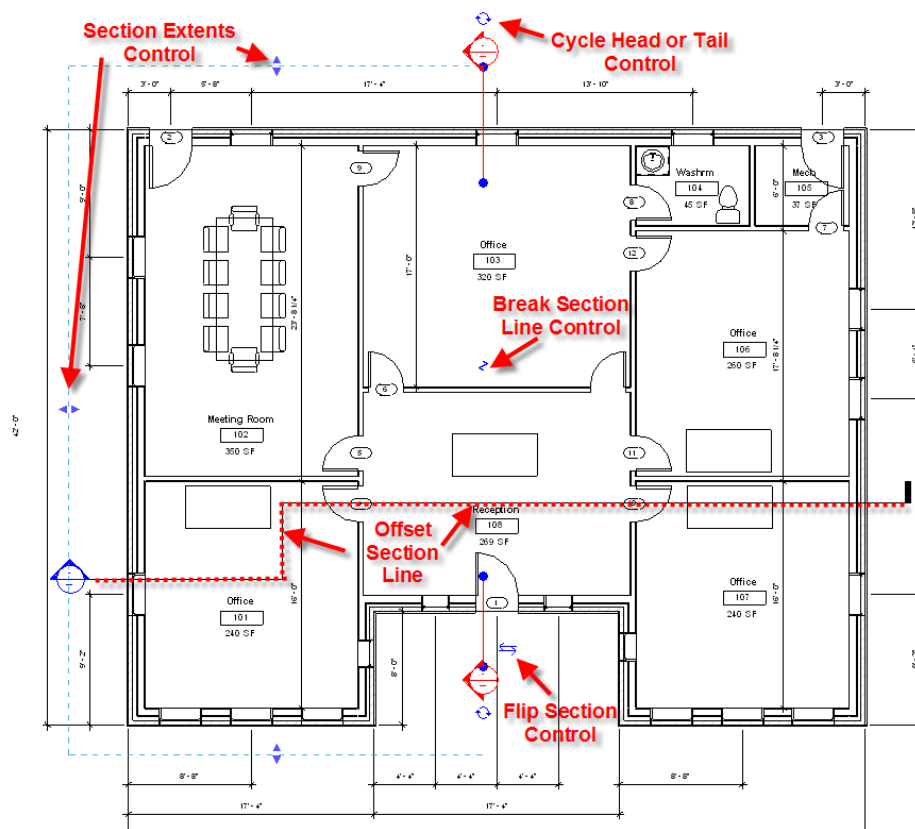
If you add a detail type section line in a plan view, it will create a Section detail which technically speaking is a vertically oriented view. If you add a detail section line in a Section or Elevation view, the orientation of the section line will determine if the resulting view is a Detail Section or a Plan Detail. Plan Details are horizontal “section” views which are defined by drawing a horizontal section line in an elevation or section view.



The Section type controls the appearance of the Section head and section tail. If you want the appearance of a section head or tail to change as shown above, choose a different section type in the Type Selector.

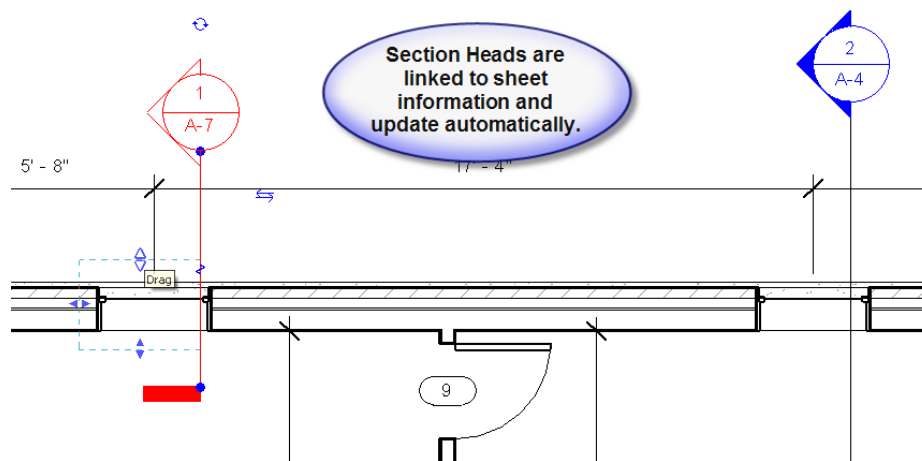
When you draw a section line, you can reverse the viewing direction for the section, indicated by the arrow on the section head, with the flip controls shown beside the Section line.

Other controls on the Section line include a break symbol on the line itself which will allow you to hide the middle portion of the section line. This can be useful if you want to create a building section but only show the section line extending a short distance through the exterior wall on either side of the building. To restore the break line, click the symbol again.



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Revit uses a default depth and width for the extents of a section but this can easily be modified by selecting the Section line and then dragging the control grips on the dashed blue line which defines the section box dimensions. The Section Head and Tail can be repositioned independently of the Section extents box. This lets you reduce the size of the section view without moving the Head too close to your building.



The Section Head will display the detail number and sheet number only after you have added the Section view to a sheet. The annotations will be linked so they will automatically update if the sheet information changes.

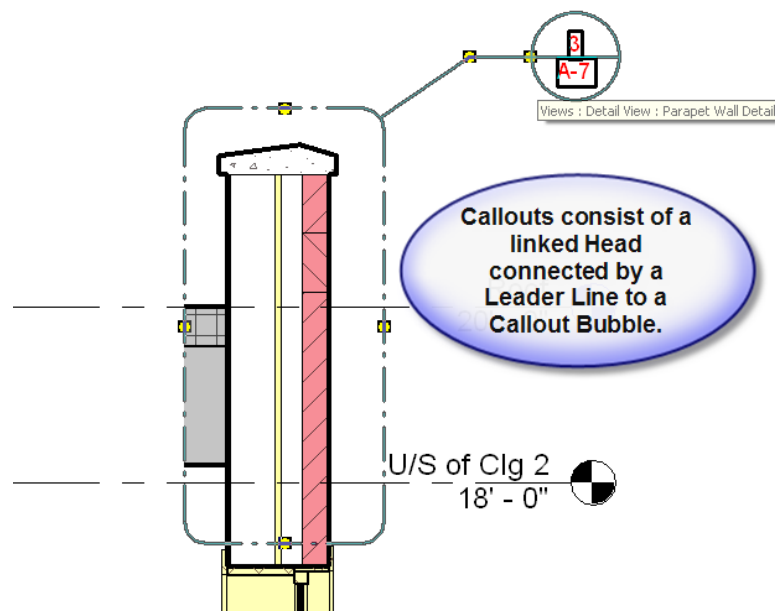
When you add Section lines in a plan view, they will also be visible in elevation and other section views. Section heads always display in blue, indicating that they are linked to other views. If you double-click a Section head, it will switch you to the linked Section view.

Sections will automatically be named to Section 1, Section 2, etc. Right-click on the view name in the Project Browser to rename the sections to Longitudinal Section for the longest section through the building and Cross Section for the shorter cut through the building.

If you select a section line and check the properties palette, you can modify the view properties for the linked section view including scale, shading, detail level, etc. When you switch to that view all settings will be updated.

2. Callout Views

Callout Views allow are details views which reference an enclosed area of an existing view at a larger scale. Callouts allow you to create progressively larger scale details that will be linked to the view in which they are created. By default, the callout view scale will be double the scale of the view in which the callout is defined.

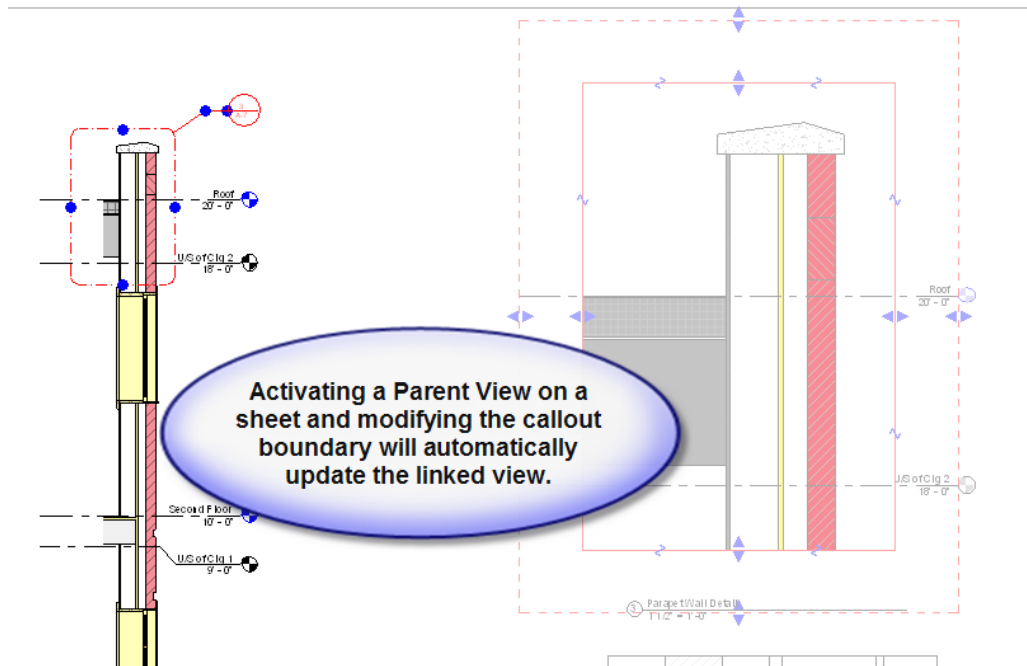


The View in which a Callout is defined is called the Parent view for a callout. The callout will be dependent on the parent view and will be deleted if the Parent view is deleted.

Callouts can be defined in Plan, Section, Detail, or Elevation views. The Callout types available in the Type Selector will vary with the current view. There will always be a View type callout corresponding to the current view plus a Detail Callout.

The different types of callouts help you organize the location of the callouts in the Project Browser. For example, if you create a callout view of a washroom in a floor plan view, setting the callout type to Floor Plan will place the new view in the Floor Plans category. If you create a callout in a Section view, you can choose to place the resulting callout in the Wall Sections category or in the Details Category, whichever is more appropriate based on the scope of the callout.

Callout Bubble boundaries define the size of the resulting callout view and the boundaries of the building elements being displayed. When you adjust the size of the callout bubble, all linked views will automatically have their crop region adjusted to match the new displayed area within the Callout Bubble. If the parent view is on the same sheet as the linked view, you can see the size of the detail view change as you modify the callout boundary.



The relationship between the Callout Bubble and the linked view is bidirectional. If you activate the dependent view and modify the size of the Crop Region, it will automatically update the size of the Callout Boundary in the Parent view.

To modify the position of the Callout Head, pick the callout, select the control grip attached to the head, and drag the Head around the callout bubble. The leader line will follow the head and stay attached to the bubble. To modify the shape of the leader line use the control grip on the leader line itself. Zoom in close to the leader line and it will be easier to get it to snap to a horizontal orientation as it attaches to the Head.

Exercise Notes

In the following exercises you will practice creating building sections, wall sections, detail sections and callout views. You will continue to develop your Construction Document set by laying out all remaining views on sheets.

1. Open the project you have been developing over the last few classes. Set the First Floor plan view active. Zoom to Fit.
2. From the View tab of the Ribbon, choose the Section tool. In the type selector, set the type to Section: Building Section. Pick a point just below and in line with the Front door, and drag your mouse all the way through the building, cutting through the door at the Front and the window at the back wall. Pick the Flip arrows to flip the direction of the section and then flip it back.
3. If the section line is overlapping the dimension witness line to the window in the back wall, select the section line and move it a few inches to one side. With the section line still selected, use the Cycle Section Tail control arrows at the top of the view to toggle through the available appearances for the tail. Set it so you have a full Head at both ends of the section.
4. In the Project Browser, a new category has been created called Sections. Expand this category, right-click on the Section 1 view, and rename it to Cross Section.
5. Double-click the Section head at either end of the Section line and it will take you to the Section View. Depending on the location of the first point you picked when you drew the section line, the portion of the building which is in an elevation style view at the left side will show a different amount of wall. The scope of the section view is controlled by the extents of the Section boundary. Switch back to the First Floor view. Set the detail level to medium and the visual style to Shaded.
6. Pick the Section line to display the blue dashed line defining the Section extents box. Pick the blue control grip on the bottom horizontal segment and drag it downwards until it is a foot or so beyond the lowest exterior wall. Select the segment at the top and drag it down until it is just a few inches from the top wall. Pick in an empty area to clear the selection.

7. Double-click the section head to switch back to the Section view. This time, the entire building length should be depicted. At the right side, though, the level labels might be a bit too close to the building because we moved the section extents line at the back of the building close to the wall. We can modify its position in this view by adjusting the crop region.
8. On the View Control Bar, choose, Show Crop Region if it is not being displayed by default. Pick the Crop region and then drag the control grips on the right side further away from the building. Adjust the length of the level lines if required. Pick the grips defining the upper and lower extents of the crop region and pull them closer to the building at the top and bottom. This will reduce the size of the view when we place it on a sheet.
9. Zoom in on the Section where you can see the top of a first floor interior wall and you will notice a gap between it and the floor object. Because our second floor object has an actual thickness of 10-3/4" our partition walls are not reaching to the underside of the joists. Use the Align tool to bring the U/S of Clg level line into alignment with the underside of the floor. (9' 1-1/4")
10. The tops of the frame walls are now touching the bottom of the joists in the floor. Since the ceiling is actually going to extend down from the joists as well, let's rename the U/S of Clg 1 and 2 levels to Top of Plate levels. Top of Plate 1 and Top of Plate 2.
11. Double click the First Floor level head to switch back to the First Floor view. Select the section line to define its extents relative to the position of the Section Heads. The latter can move independently by using the control grips where the head connects to the section line. Adjust the heads so they do not interfere with any dimension lines. Adjust the length of the dimension witness lines if necessary.
12. Add a second, Building Section line starting on the left side of the building and cutting all the way through to the other side. Drag the section line through one of the windows on the left side of the building. Cycle the tail display to change it and show a head at both ends.
13. Select the Section line and from the Section panel on the Ribbon, choose Split Segment. Pick a point just to the right of the main North-South interior wall and then drag your mouse up until the offset segment is passing through the interior door opening of the second office to the North, before continuing through the other side of the building. In the Project Browser, right click on the new view and Rename the section from Section 1 to Longitudinal Section.

14. Double-click the Longitudinal Section view to make it active. Adjust the Crop region and adjust the position of the level labels to bring the region border close to the building. Turn off the Crop Region display when you have finished adjusting the region shape. Set the detail level to Medium and the graphics display to Shaded.
15. The Section line for the Cross Section is correctly displaying in this section view and its head and tail should be quite close to the building. If you pick the Section line, it displays its extents box and control grips allowing you to adjust the position of the Head or tail if required. If you would like to hide the section line in this view, you could use visibility controls to hide the category or the selected element. You can also use a property called "Hide at Scales coarser than..." to control the visibility.
16. With the section line selected, check the value for the Hide at Scales property. It should be $\frac{1}{4}"=1'-0"$ which matches our view scale. Change the value to $\frac{3}{8}"=1'-0"$ and the section line will disappear. Change the value to $\frac{3}{16}"=1'-0"$ and the section line will reappear. This value is linked to the scale shown the view control bar for the current view. $\frac{1}{4}"=1'-0"$ is coarser than $\frac{3}{8}"=1'-0"$ and thus the section line is hidden as per the Hide at Scales setting. Set the value back to $\frac{1}{4}"=1'-0"$.
17. Double click the section line head to switch to the Cross section. In this view you can see the Section line for the Longitudinal Section. Adjust the position of the head and tail for this section line as well to bring them closer to the building. Set the detail level to Medium and the graphics display to Shaded.
18. Switch to the Floor Plan View. The offset section should show its path as it cuts through the building but the first section line we created can be shown with the middle section broken out. Pick the first section line for the Cross Section and pick the break symbol on the section line. Adjust the length of the remaining segment lines as desired by dragging the control grips on their endpoints.
19. Try toggling the break symbol on the jogged section line just to see how it is handled and then pick it again to toggle it back to a continuous line.

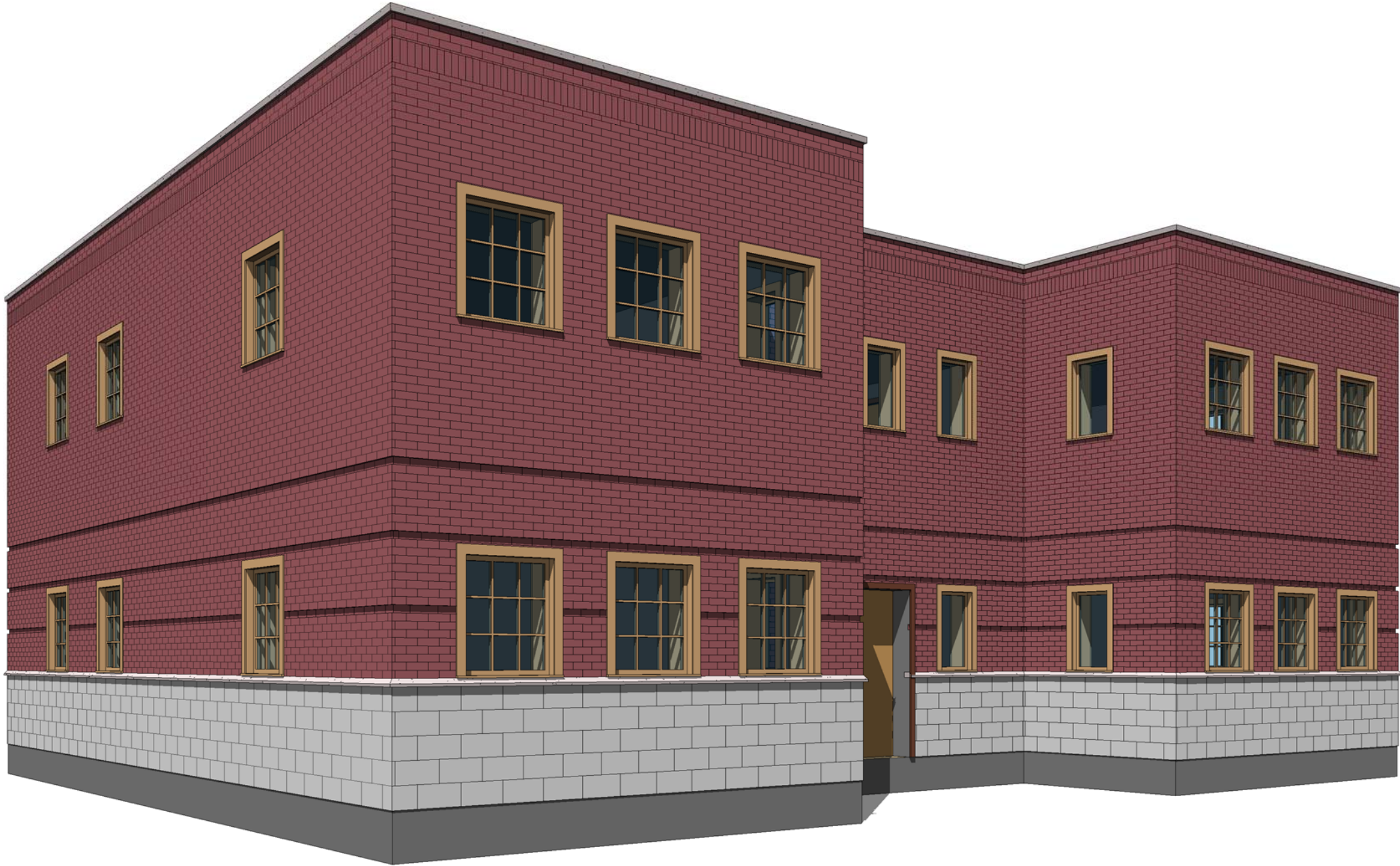
20. Speaking of Continuous lines, it might be nice to know how to adjust the line type for the section line as they are often shown with a center line type instead of continuous. This type of change is setup as a global control for the entire project and is set in the Object Styles. From the Manage Tab on the Ribbon, choose Object Styles. Select the Annotation Objects tab and scroll down to the Section Line category. In the Line Pattern column, to the right of Section line, pick Solid and change it to Center 5/8". Pick OK to close the dialog and apply the change.
21. Zoom in to the Meeting Room in the upper left of the Plan. From the View tab, choose the Section tool and in the Type selector, choose Section: Wall Section. Pick a point above the window in the back wall and drag a short section line down through the window and into the meeting room. Flip the section if necessary so it is viewing to the left side.
22. Adjust the extents of the section box to a small rectangle about a foot and a half square. Adjust the position of the head and tail to fit close to the wall. If required move the dimensions away from the building to avoid any interference with the Section lines. Alternatively, you can drag the section head to the outside of the dimension string. All annotations must read clearly and section heads should not overlap the dimension line or extension line.
23. Double-click the section head for the new wall section to set that view current. In the Project Browser, expand the new Sections (Wall Section) category and rename Section 1 to Wall Section W1.
24. Pick the Section view to display the Crop Region and adjust the perimeter as required to bring the top and bottom closer to the building elements and to adjust the position of the level labels relative to the wall.
25. Pick the level lines, ensure that the 2D toggle is enabled and drag the open ends of the lines into the left edge of the crop region. Set detail level to medium and the visual style to shaded.
26. Set the Longitudinal Section view current. Adjust the positions of the wall section head and tail to pull them into alignment with the head and detail of the Cross Section view.
27. In the upper right corner you should see a room with a 3 foot window shown in elevation on the back wall. Zoom in to this area on the section view.

28. From the View tab, choose Section and in the type selector choose Section: Detail View. Pick a point about a foot below the sill and drag your cursor up into the middle of the window. Cycle the visibility of the section tail to off.
29. Pick the section line and drag the width of the section box so it extends just outside of the window. In the Properties palette, set the scale to $1 \frac{1}{2}'' = 1'-0''$.
30. From the View tab, choose Section and in the type selector choose Section: Detail View. Pick a point to the right of the window and drag your mouse horizontally to define a Plan Detail cutting through the window jamb. Hide the section tail and adjust the size of the section extents so it extends below the window.
31. In the Project Browser you have a new Category called Detail Views. Expand this category and rename Detail 0 to Window Sill Section. Rename Detail 1 to Window Jamb Detail. Even though we created this detail with a section line, it is actually a plan detail and not a true section view, which by definition is a vertical cut through one or more elements.
32. Switch to both of the detail views and adjust the views if required. Set the detail level to medium and fine-tune the size of the detail crop region.
33. Switch to the Wall section view and zoom in on the top of the section around the roof. From the View tab on the Design Bar, choose Callout and pick a point just inside the wall, below the ceiling but above the window. Drag up and to the right to define a rectangular callout region that encompasses the top of the wall and capstone.
34. Pick the callout bubble to select it and then reposition the callout head by dragging the control grip located at the quadrant of the Head. Drag the head up and to the right above the callout bubble. Pick the control grip on the leader line, zoom in and drag the grip up to create a horizontal section of leader where it attaches to the callout head.
35. In the Detail Views section in the Project Browser, rename the new view from Detail 0 to Section thru Parapet Wall. Okay.
36. Switch to either of the Building Section views and zoom in to the lower right corner where the exterior wall is overlapping the floor system. We will not be drawing the foundation walls for this project so we will edit the floor boundary to extend to the face of the brick. Pick the floor and choose Edit Boundary. Select the first floor view for editing the sketch. Tab-select the entire chain of sketch lines and then set the offset value on the option bar to 7". Finish the Sketch.

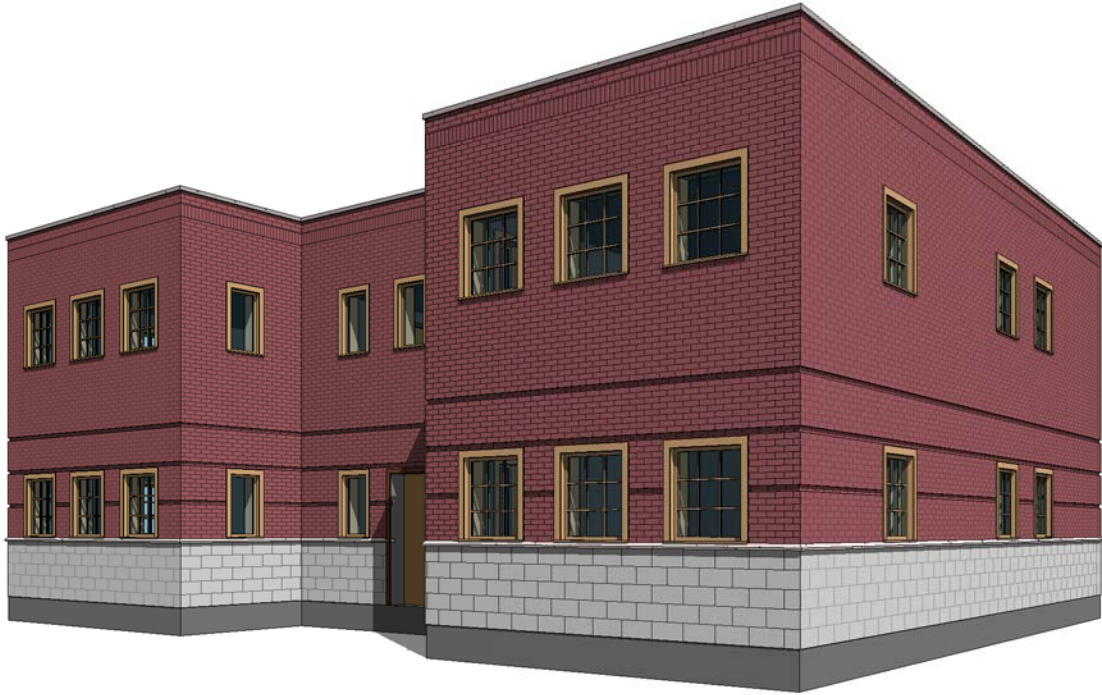
38. Time to clean up the views and lay them out on sheets. Switch to First Floor view and confirm all section lines and heads are positioned correctly. Switch to the Second Floor View. Set the scale to $3/16"=1'-0"$ and then set it to $1/4"=1'-0"$ to see how the annotations will hide and display based on the scale.
39. At $1/4"=1'-0"$ this view displays all of the full section lines and the wall section line plus it also shows the two detail lines around the window in the back wall. Zoom in around this window. Revit has cleverly added these annotation symbols showing the section through the sill with a section line and tail and the plan detail with a callout bubble. Pick the callout bubble and reposition the leader and callout head so they are displayed outside the wall. If the tail and head are displayed on the wrong sides of the wall, use the cycle controls to get the head on the outside of the wall. Leave the section tail visible in this view. If you have not yet added doors to the walls on this floor, do so now. There should be four doors.
40. Switch to the Elevation views one at a time and adjust the position of the Building Section and Wall Section heads and tails so they are close to the building. Use the Override Graphics in View / By Element to hide the display of the two detail section lines through the window on the second floor. Check all of the new section views and detail views to confirm they are being displayed correctly. (scale, detail, model graphics, extra symbols hidden, etc.)
41. In the Sheets category, switch to A-1 – Floor Plan. All of the section lines have already been added and are up to date on the sheet. Let's renumber this sheet from A-1 to A-2 so we can use A-1 for a sheet with Perspective views. Right-click on the sheet name and choose Rename. Change the Sheet number to A-2 and the name First Floor Plan.
42. Right-click on the Sheets Category and create a new sheet with the C-size layout we used for the first floor plan. Note how all of the project specific information we entered on the first sheet has been added automatically to the new sheet. Note also, how the sheet has automatically been numbered to A-3, following the convention of our other sheet. Rename the Sheet to Second Floor Plan.

43. From the Project Browser, drag the Second Floor View on to the sheet. Drag the view into the centre of the sheet by picking and dragging if required and shorten the length of the View title extension line. Zoom in on the View title. The Name on the title is the same as the view name. If we edit the name of the view directly on the title it will rename the original view as well. To display a different name on the sheet, enter it in the Title on Sheet field in the element properties for the selected view.
44. Move your mouse over the viewport and pick it. Right click and choose Element Properties. Under Identity Data, enter Second Floor Plan in the Title on Sheet field. You can also rename the actual view name in this section if you wish. Scroll through the other options in this dialog. Any changes you make here are affecting not only the view on the sheet, but the original working view as well. The sheet views are merely a snapshot of the working views.
45. Create two new sheets called A-4 - Elevations and A-5 – Elevations. Set A-4 Current and add the South View at the top of the sheet and the East view at the bottom. Move the view titles so they are in line with the edge of the building a bit closer to the bottom edge on each view. Then, move one view so its view title aligns with that on the other view. Repeat on Sheet A-5, adding the North elevation at the top and the West elevation aligned below.
46. Create a new sheet called A-6 - Building Sections. Drag the Longitudinal Section view on to the top of the sheet and the Cross Section view on the lower half. Move the view titles and then move the views to align the titles.
47. Review the four elevations and both sections to see how the level lines are displaying. If you need to add elbows to any of the level lines, pick the viewport, right-click and choose Activate View. This will allow you to edit within the context of the sheet view. When you have finished making changes, right-click over the viewport and choose Deactivate View or just double click outside the view.
48. Create a new sheet and rename it to A-7 – Wall Sections and Details. Drag the Wall Section view on to the left side of the sheet. The scale should be set to $\frac{1}{2}'' = 1'-0''$. Adjust the view title position if required. Activate the view and hide the Crop Region display.
49. Expand the Detail Views in the Project Browser and drag the Section thru Parapet Wall view on to the top right section of the sheet. The scale should be set to $1 \frac{1}{2}'' = 1'-0''$. Adjust the view title position.

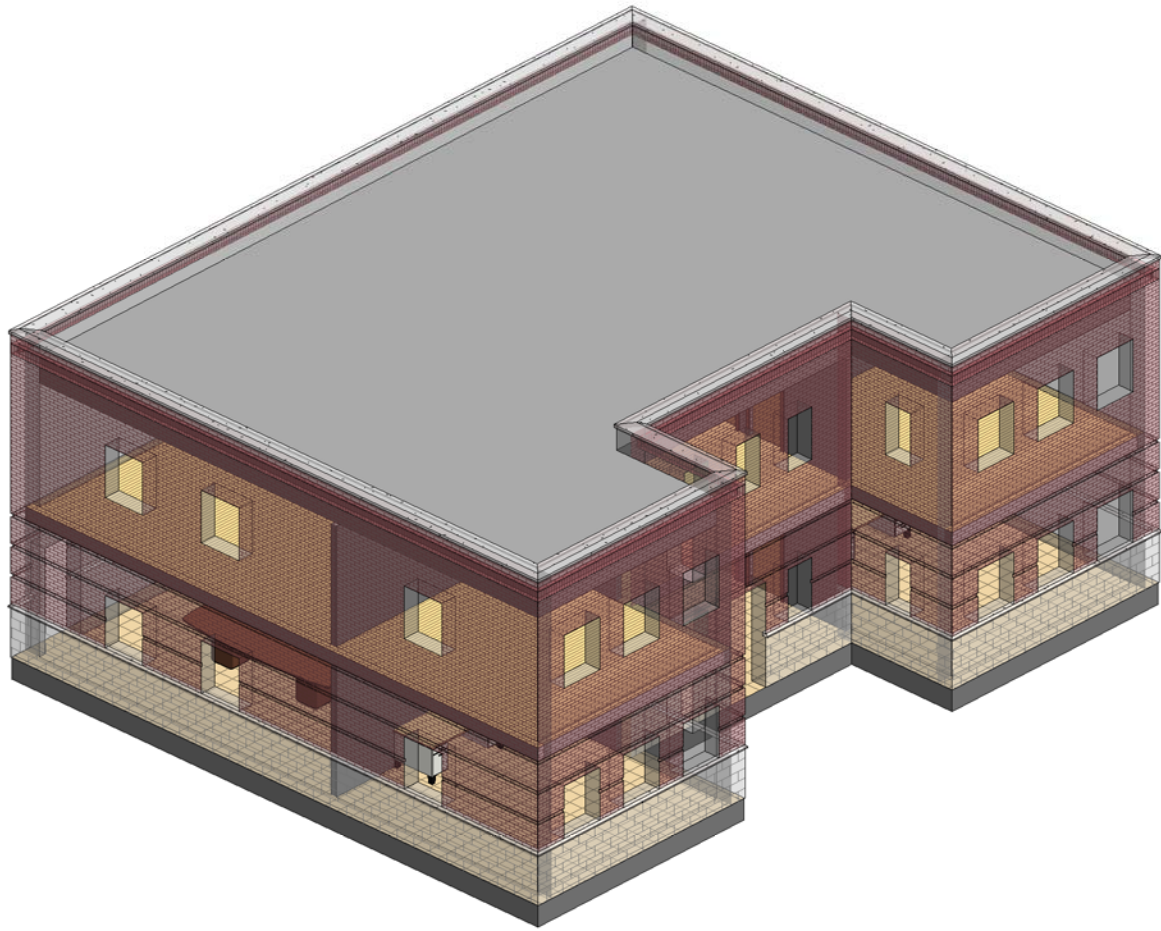
50. Select the viewport for the Wall Section, right click and choose Activate View. Create a new callout around the intersection of the second floor and the exterior wall. Rename the view to Section thru Floor at Wall. Deactivate the wall section viewport and drag the new detail view on to the sheet below the Parapet detail. As you move the lower detail back and forth a smart alignment line will appear when the core of the wall below is in line with the core of the wall above.
51. Create a new sheet called A-8 – Window Details. Drag the two window details on to this sheet. Change the scale for the two detail views to $3'' = 1'-0''$. Switch to the Cross Section and create a callout view through the head of a window in the sectioned wall at the right side. Rename the view to Window Head Section. Activate the new view and hide the section annotation category. Add the new callout view to the Window Details sheet.
52. Create one more sheet called A-1 – Perspectives. Add your favorite perspective view of the front of the building on the top half of the sheet. If the view needs to be resized, pick the viewport and choose the Size button on the Options bars. Choose lock scale and set the width you wish the view to cover on the sheet.
53. Add two more perspectives or 3D views at a smaller size in the lower half of the sheet. Arrange the titles below the views and then activate each view in turn and turn off the Crop Region if it is visible.
54. Review your sheets one more time for any adjustments that are required and to finish filling in the sheet specific title block information. Make sure that you are using a consistent level of detail (medium) and a consistent visual style (hidden line or shaded), for all views. Pat yourself on the back for a job well done. 😊
55. Save and close your file. Back up your project for safekeeping.



① SW Perspective



③ SE Perspective



② SW-Iso-Transparent



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No.	Description	Date

Green Inc.
Meadow Center
Perspectives

Project number	2016-001
Date	Issue Date
Drawn by	KB
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A-1

Scale



1 First Floor
1/4" = 1'-0"



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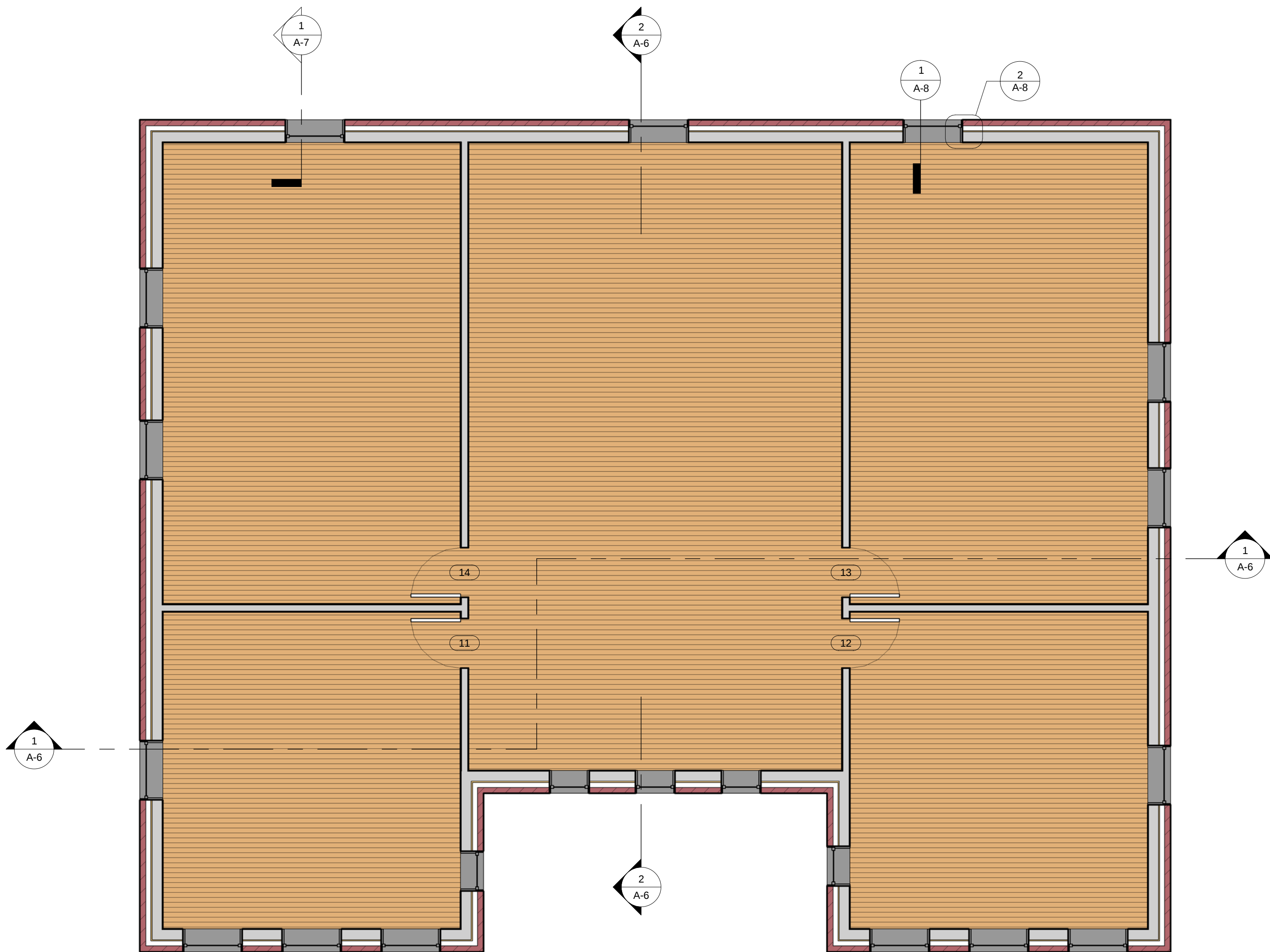
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Green Inc.
Meadow Center
First Floor Plan

Project number	2016-001
Date	Issue Date
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A-2

Scale	1/4" = 1'-0"
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① Second Floor
1/4" = 1'-0"



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Green Inc.
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Second Floor Plan

Project number	2016-001
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A-3

Scale	1/4" = 1'-0"
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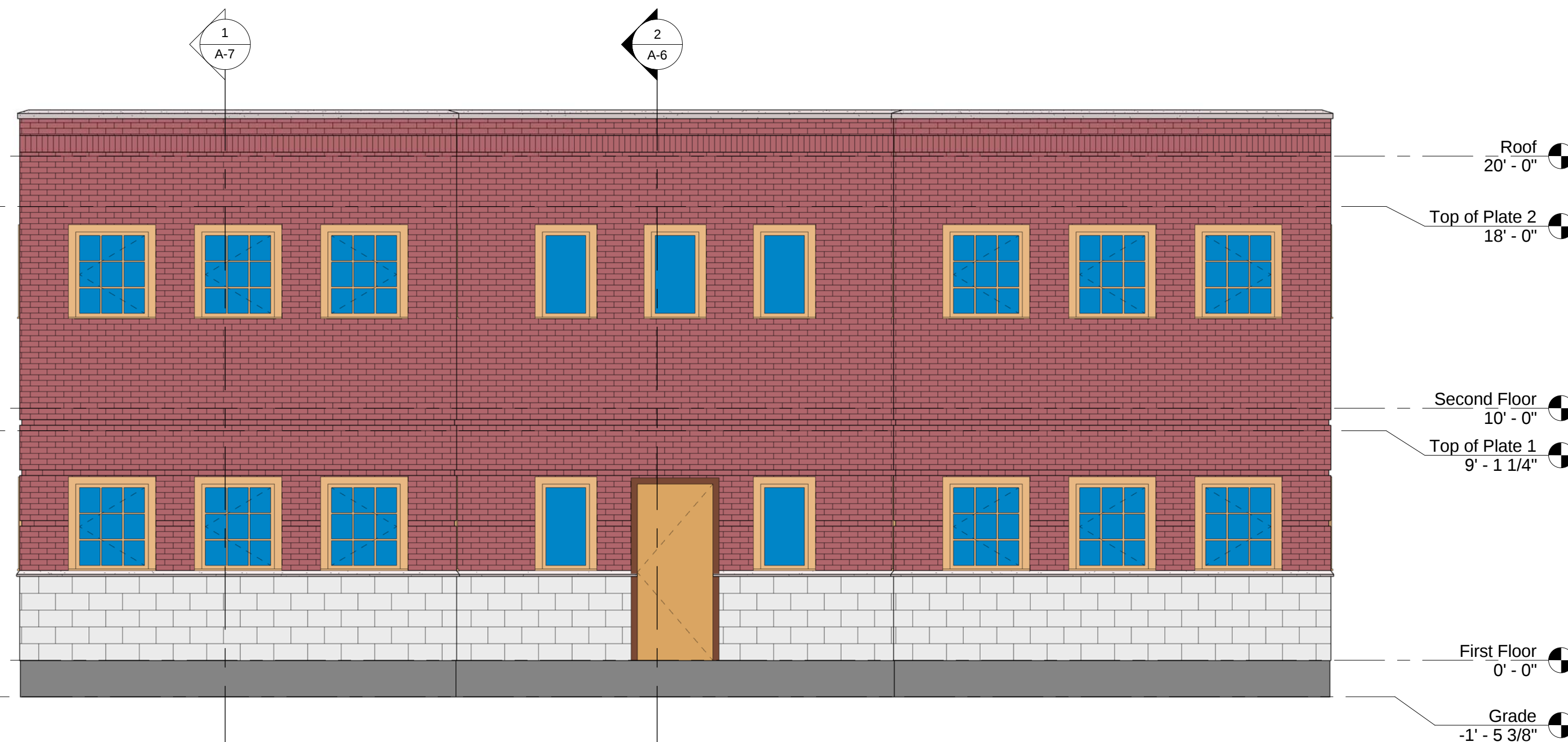
Green Inc.
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Project number	2016-001
Date	Issue Date
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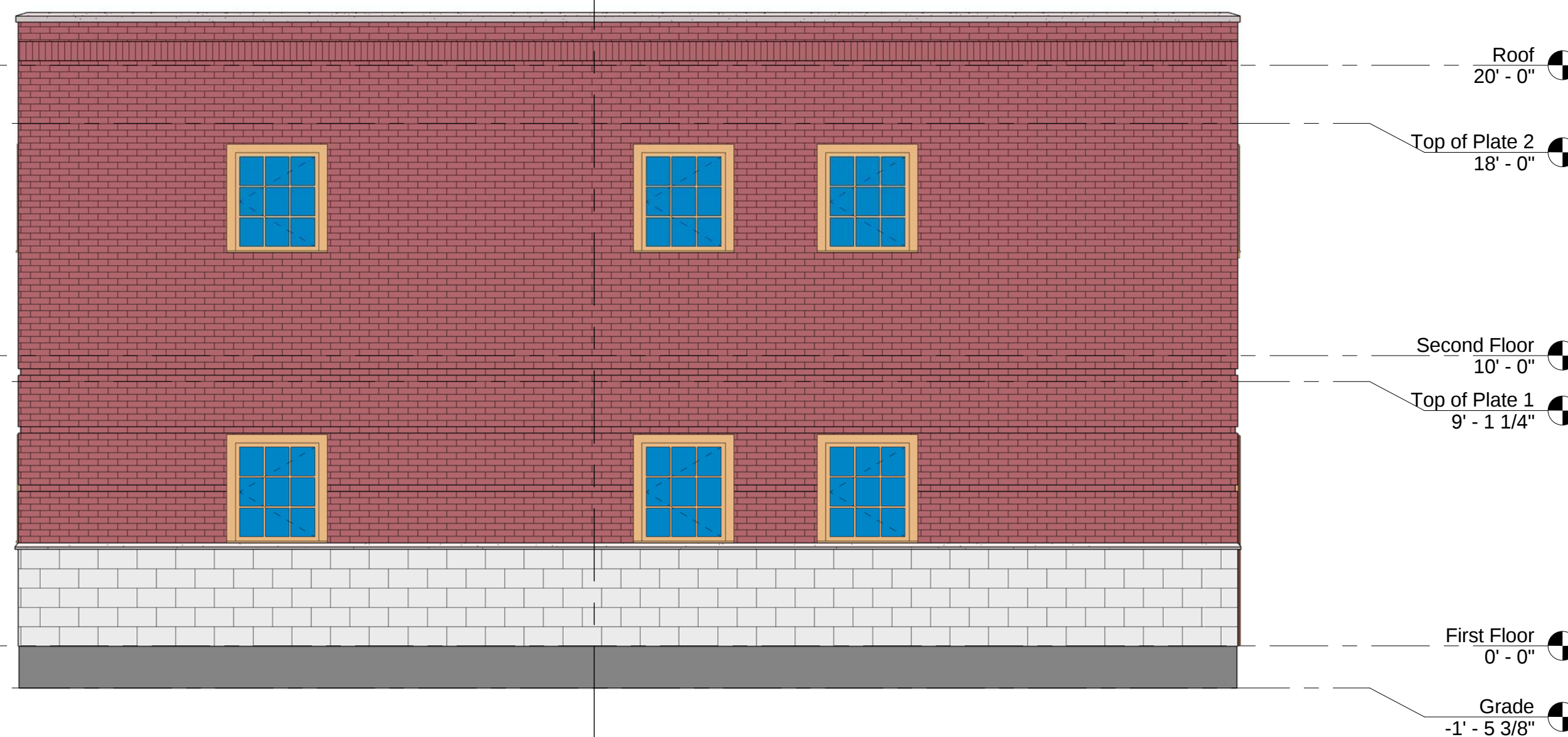
A-4

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① South Elevation
1/4" = 1'-0"



② East Elevation
1/4" = 1'-0"



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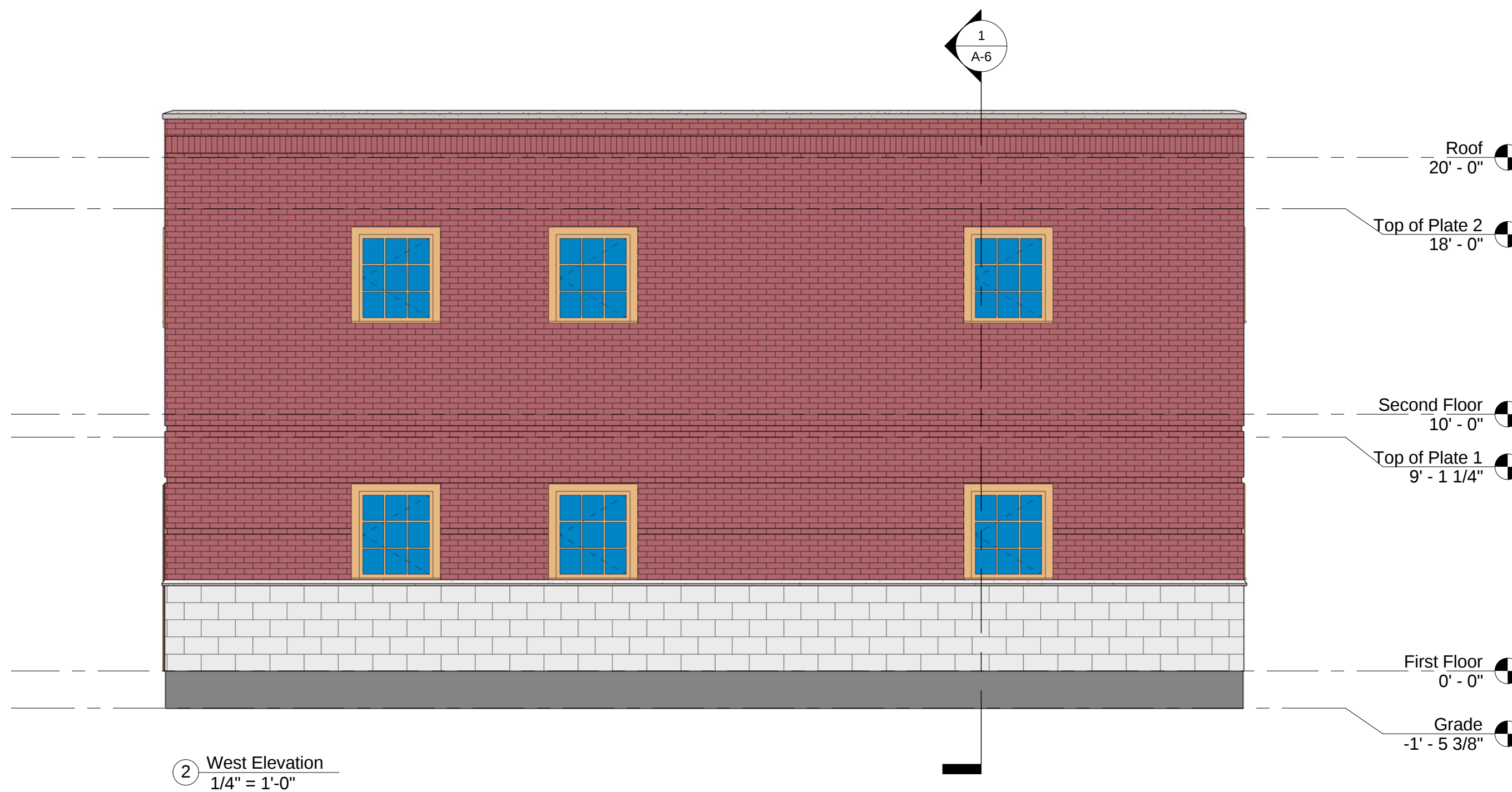
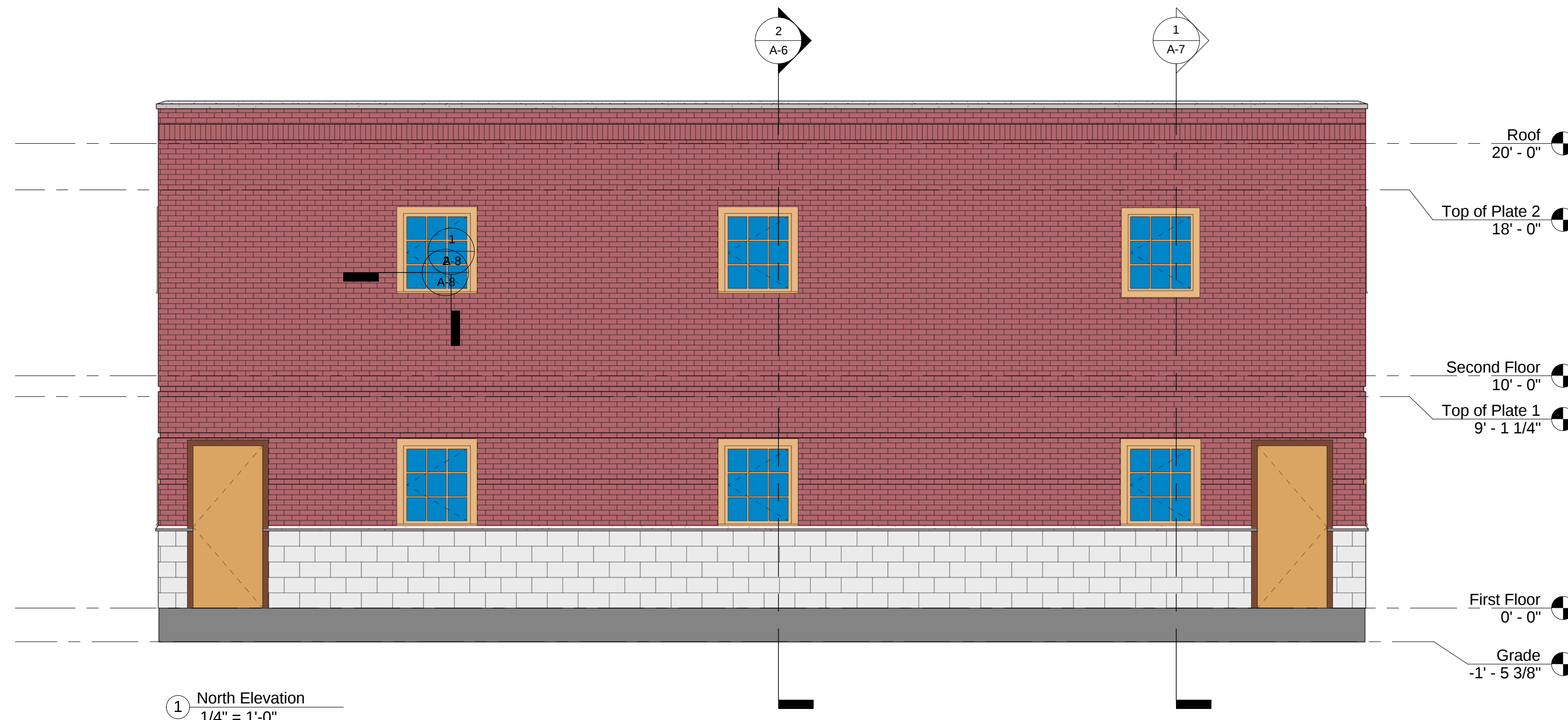
Green Inc.
Meadow Center
Elevations

Project number	2016-001
Date	Issue Date
Drawn by	Author
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A-5

Scale	1/4" = 1'-0"
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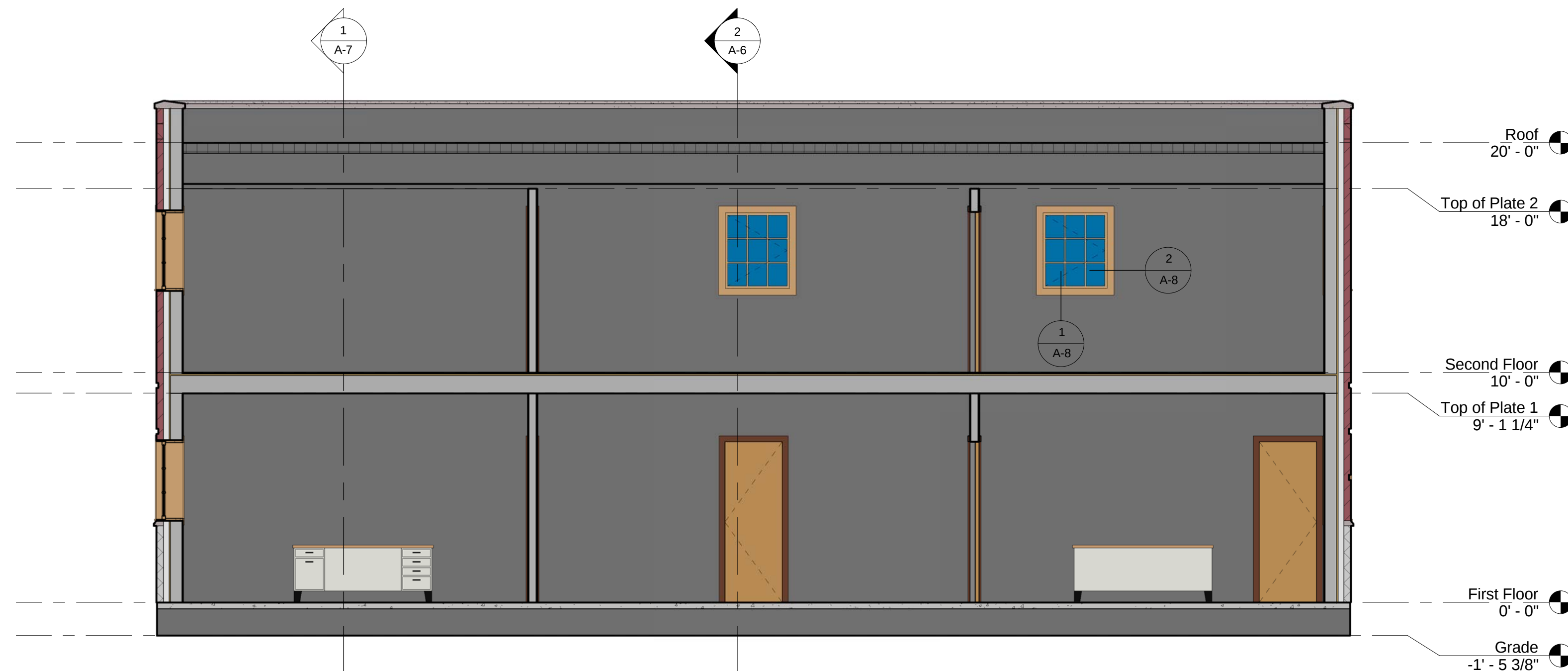
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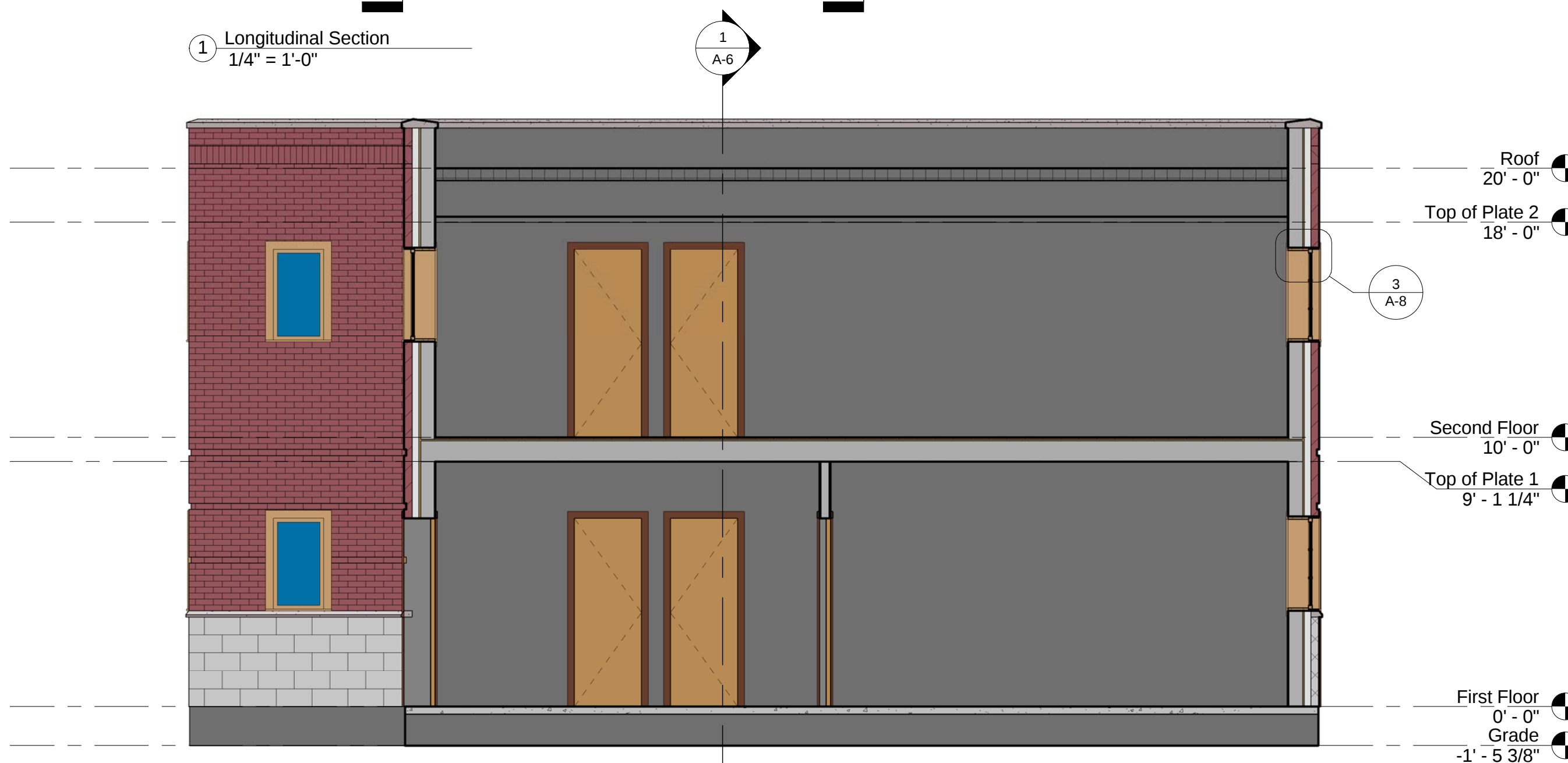
No.	Description	Date

Green Inc.	
Meadow Center	
Building Sections	
Project number	2016-001
Date	Issue Date
Drawn by	KB
Checked by	KB
A-6	
Scale	1/4" = 1'-0"

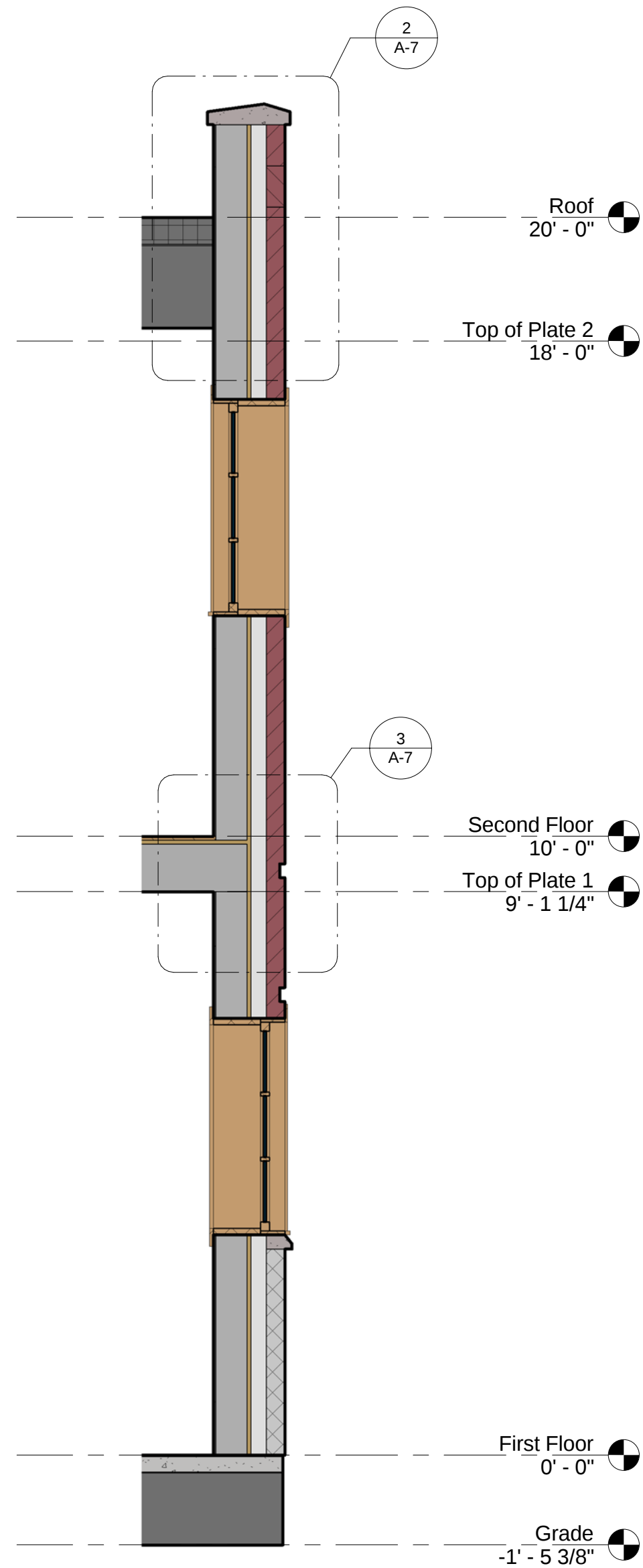
26/06/2015 12:25:29 PM



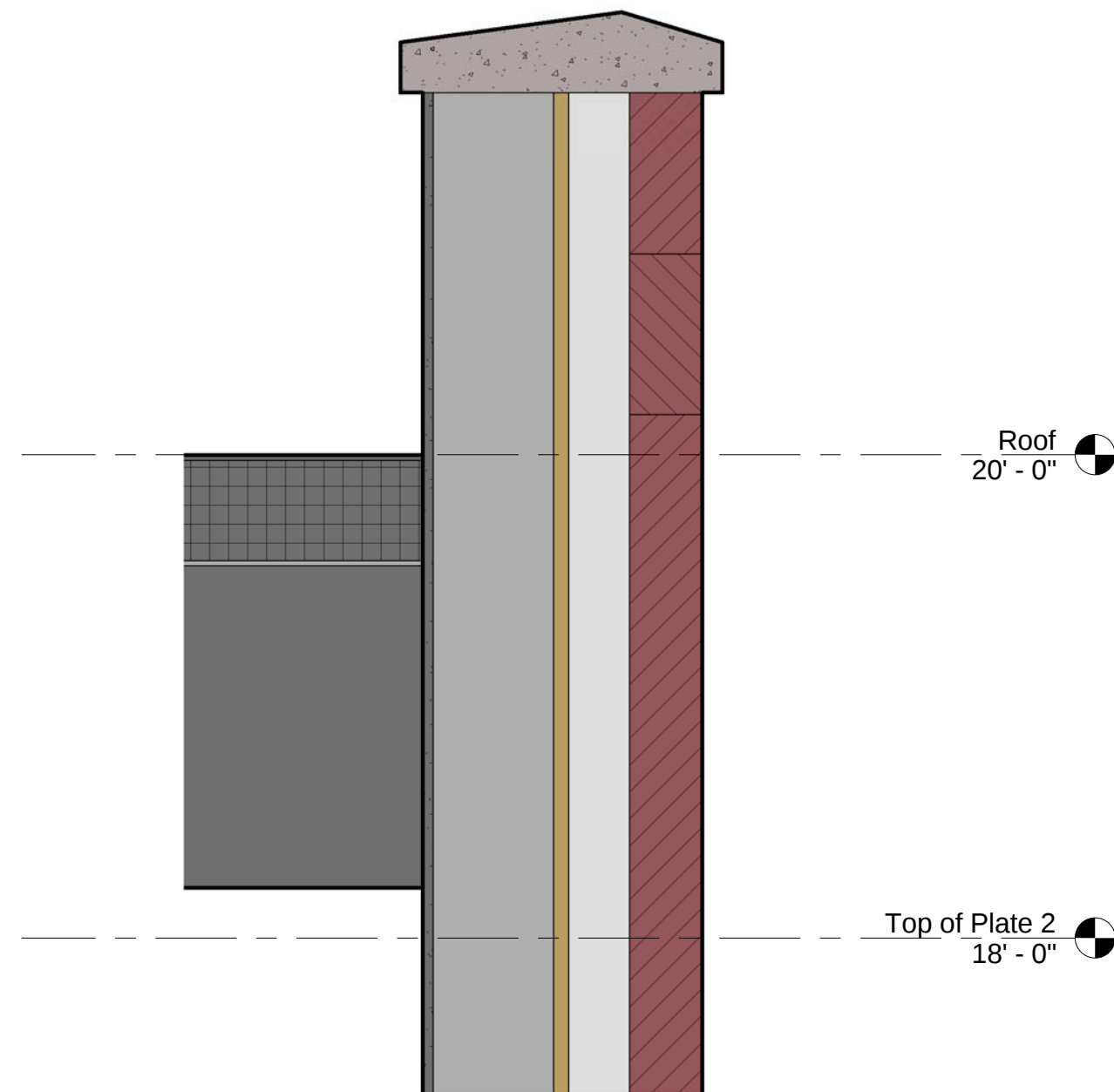
1 Longitudinal Section
1/4" = 1'-0"



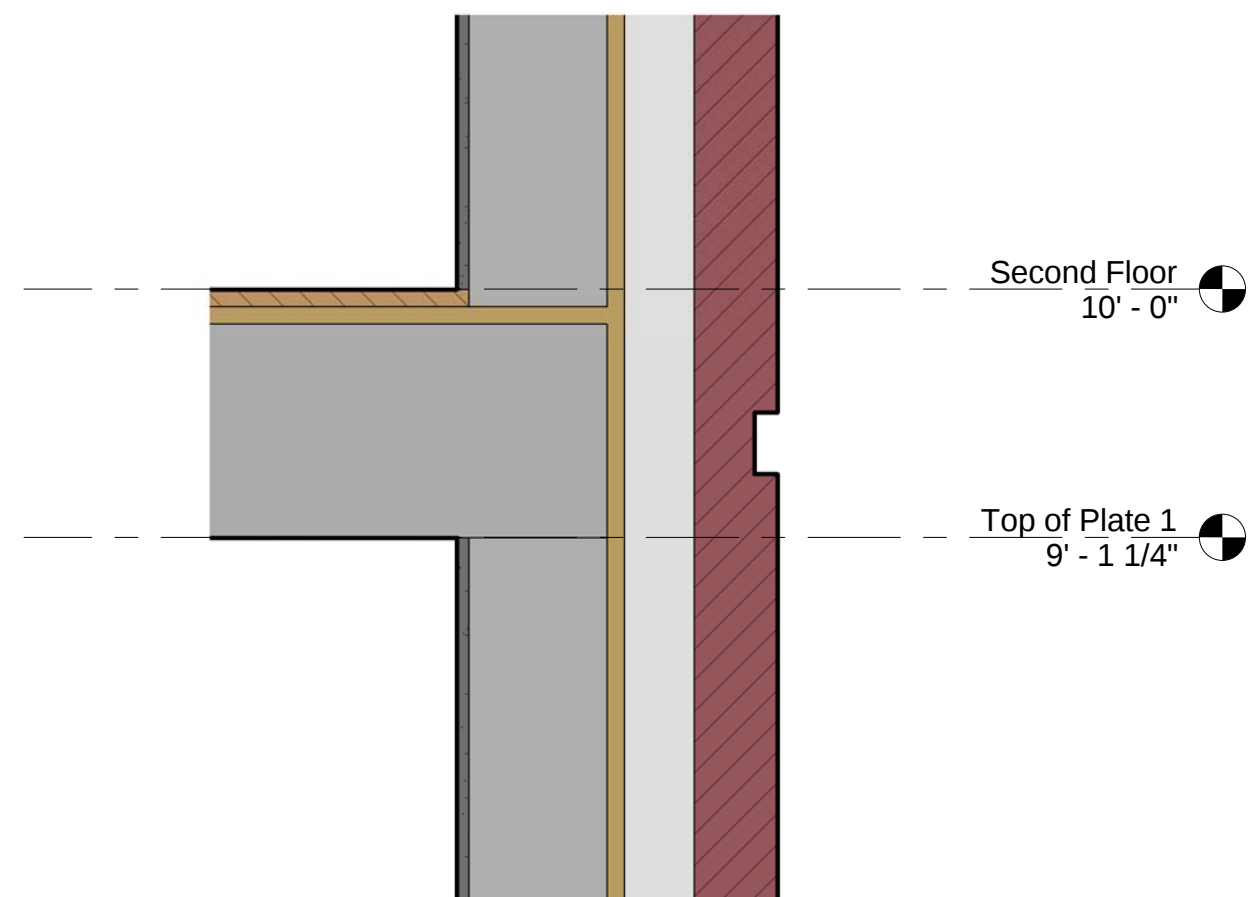
2 Cross Section
1/4" = 1'-0"



① Wall Section W1
1/2" = 1'-0"



② Section Thru Parapet Wall
1 1/2" = 1'-0"



③ Section Thru Floor at Wall
1 1/2" = 1'-0"



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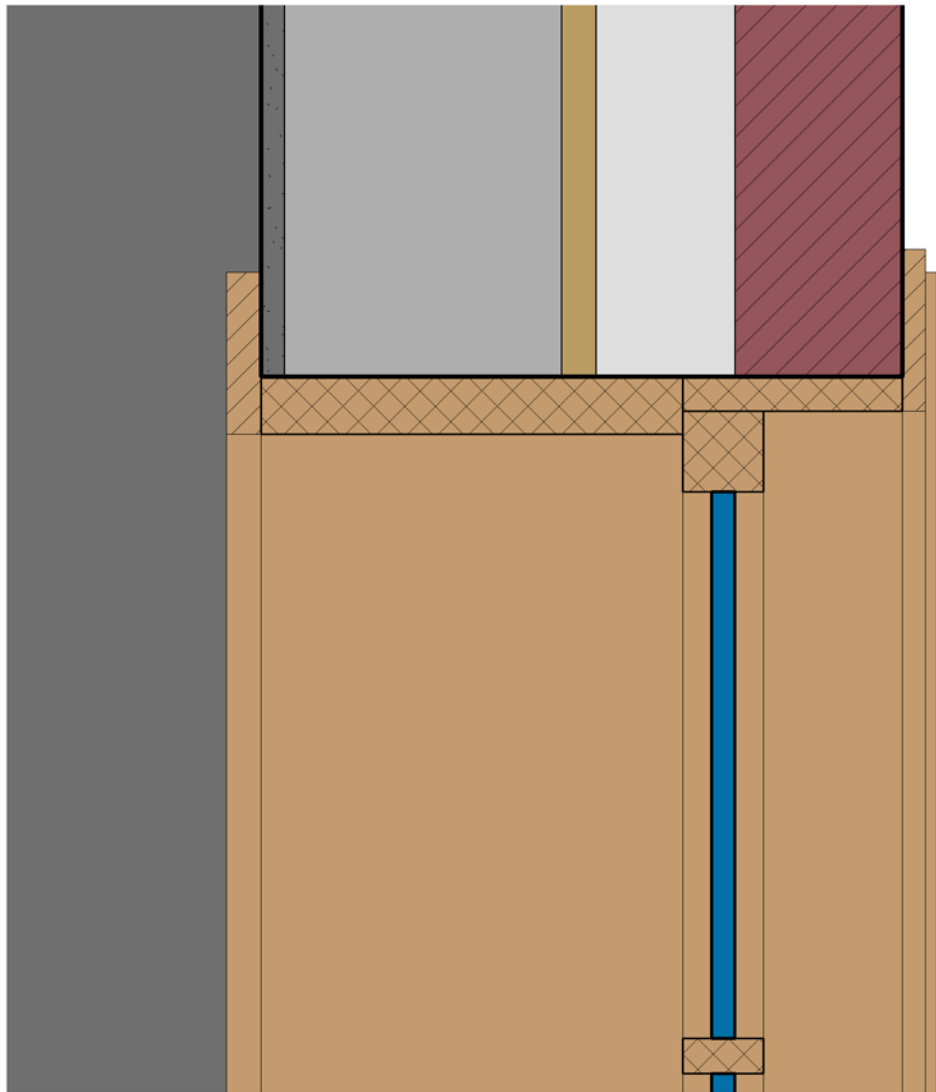
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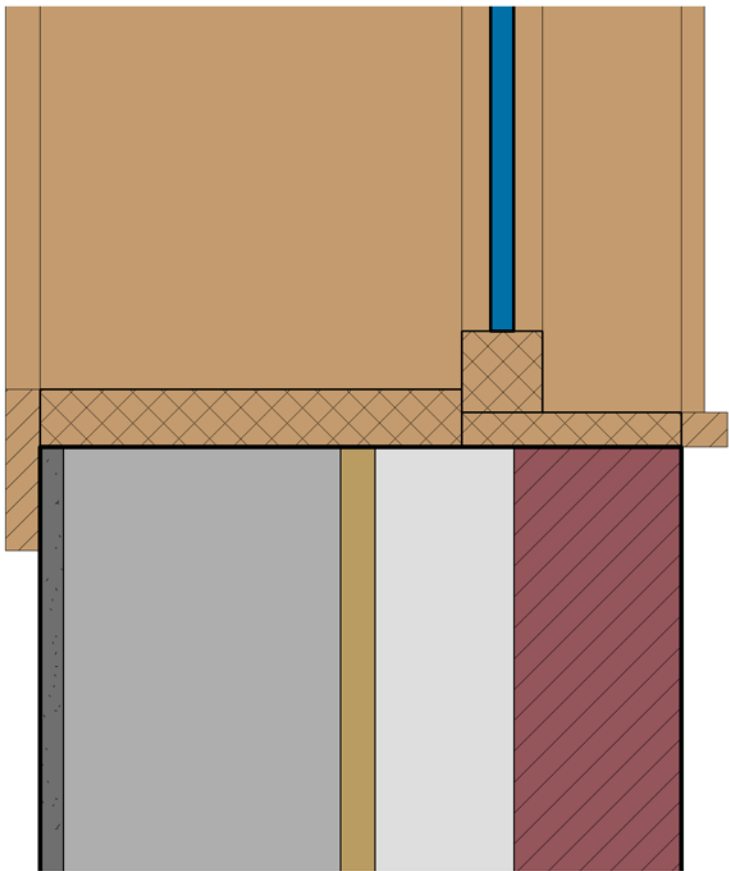
Consultant
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No.	Description	Date

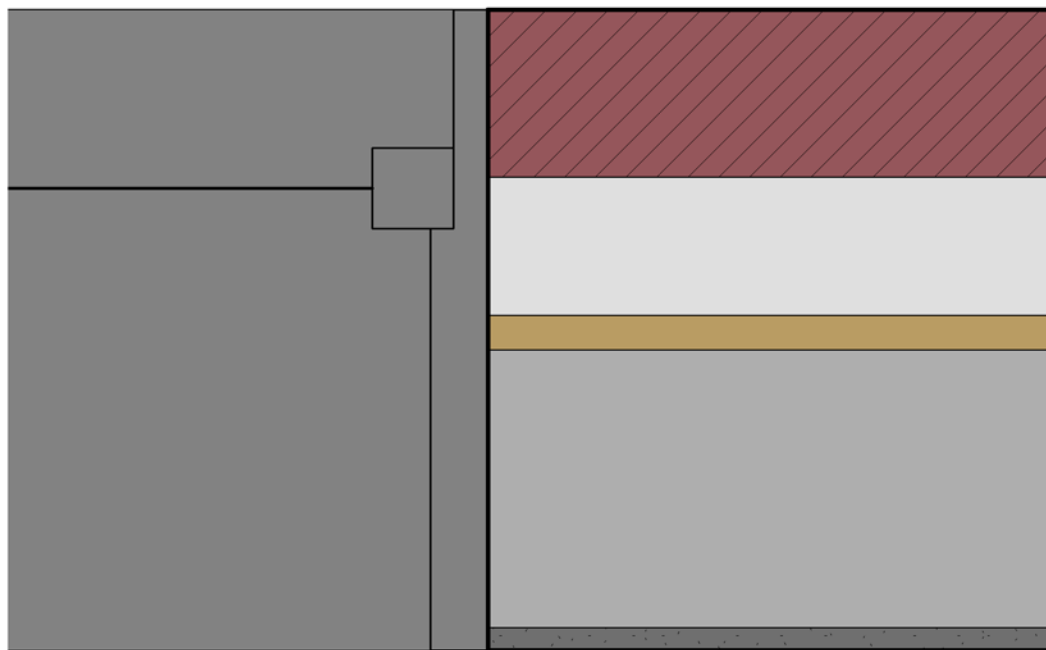
Green Inc.	
Meadow Center	
Wall Section and Details	
Project number	2016-001
Date	Issue Date
Drawn by	Author
Checked by	Checker
A-7	
Scale	As indicated



③ Window Head Section
3" = 1'-0"



① Window Sill Section
3" = 1'-0"



② Window Jamb Detail
3" = 1'-0"



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No.	Description	Date

Green Inc.
Meadow Center
Window Details

Project number	2016-001
Date	Issue Date
Drawn by	KB
Checked by	Checker

A-8

Scale	3" = 1'-0"
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